What is claimed:

1. A bacterial host cell comprising a nucleic acid sequence comprising a promoter and nucleic acid sequence encoding a heterologous polypeptide; the nucleic acid sequence being operably linked to the promoter which is controlled by a response regulator protein; the host cell being genetically modified such that the promoter is regulated by acetyl phosphate in the absence of nitrogen starvation.

2. The host cell of claim 1 wherein the bacterial cell is an *E. coli* cell.

3. The host cell of claim 1 wherein the promoter is controlled by a response regulator protein selected from the list consisting of ntrC, phoB, phoP, ompR, cheY, creB, and torR.

4. The host cell of claim 3 wherein the promoter is bound by ntrC.

5. The host cell of claim 4 wherein the promoter is *glnAp2*.

6. The host cell of claim 1 wherein the host cell is genetically modified by deletion or mutation of a gene encoding a histidine protein kinase.

7. The host cell of claim 6 wherein the histidine protein kinase is encoded by glnL.

8. The host cell of claim 1 wherein the heterologous polypeptide is a biosynthetic enzyme required for production of a metabolite.

9. A host cell comprising a first expression cassette comprising a promoter and a nucleic acid sequence encoding a first enzyme required for biosynthesis of a heterologous metabolite; the nucleic acid sequence being operably linked to the promoter which is regulated by acetyl phosphate in the absence of nitrogen starvation; and nucleic acid sequences expressing other enzymes required for biosynthesis of the metabolite.

10. The host cell of claim 9 wherein the metabolite is an isoprenoid.

11. The host cell of claim 10 wherein the isoprenoid is a carotenoid.

12. The host cell of claim 10 wherein the isoprenoid is lycopene, β-carotene, astaxanthin, or one of their precursors.

13. The host cell of claim 10 wherein the first enzyme is isopentenyl diphosphate isomerase, geranylgeranyl diphosphate synthase, or 1-deoxyxylulose 5-phosphate synthase.

14. The host cell of claim 9 wherein the first enzyme is phosphoenolpyruvate synthase.

15. The host cell of claim 9 wherein the host cell is a bacterial cell.

16. The host cell of claim 15 wherein the bacterial cell is an *E. coli* cell.

17. The host cell of claim 15 wherein the cell is lacking a functional histidine protein kinase gene.

18. The host cell of claim 15 wherein the promoter is controlled by ntrC, phoB, ompR, cheY, creB, phoP, or torR.

19. The host cell of claim 18 wherein the promoter is bound by ntrC.

20. The host cell of claim 19 wherein the promoter is *glnAp2*.

21. The host cell of claim 10 wherein the host cell further contains a second expression cassette comprising a nucleic acid sequence encoding a phosphoenolpyruvate synthase operably linked to a promoter which is regulated by acetyl phosphate concentration.

22. A method of producing heterologous isoprenoids in a host cell comprising overexpressing a heterologous phosphoenolpyruvate synthase; and expressing biosynthetic enzymes required for synthesis of the heterologous isoprenoid.

23. A method of producing a lycopene in a host cell comprising expressing a heterologous 1-deoxy-D-xylulose 5-phosphate synthase, a heterologous geranylgeranyl diphosphate synthase, a heterologous phytoene synthase, and a heterologous phytoene desaturase.

24. A kit comprising a nucleic acid sequence containing a promoter controlled by a response regulator protein such that the promoter is regulated by acetyl phosphate in a defined host cell; and the defined host cell which is genetically modified by deletion or mutation of a histidine protein kinase gene.

25. A nucleic acid sequence comprising a promoter and a sequence encoding a biosynthetic enzyme required for the production of a first metabolite, the sequence being operably linked to the promoter which is regulated by a second metabolite whose concentration is indicative of availability of a precursor for the biosynthesis of the first metabolite.

26. The nucleic acid sequence of claim 25 wherein the second metabolite is a waste product produced from a precursor for the biosynthesis of the first metabolite.

27. The nucleic acid sequence of claim 25 wherein the first metabolite is an isoprenoid.

28. The nucleic acid sequence of claim 27 wherein the isoprenoid is a carotenoid.

29. The nucleic acid sequence of claim 28 wherein the isoprenoid is lycopene, β-carotene, astaxanthin, or one of their precursors.

30. The nucleic acid sequence of claim 25 wherein the second metabolite is acetyl phosphate, cAMP, fructose 1-phosphate, or fructose 6-phosphate.

31. The nucleic acid sequence of claim 30 wherein the second metabolite is acetyl phosphate.

32. The nucleic acid sequence of claim 31 wherein the promoter is controlled by ntrC, phoB, ompR, cheY, creB, phoP, or torR.

33. The nucleic acid sequence of claim 32 wherein the promoter is bound by ntrC.

34. The nucleic acid sequence of claim 33 wherein the promoter is *glnAp2*.

35. The nucleic acid sequence of claim 27 wherein the biosynthetic enzyme is isopentenyl diphosphate isomerase, geranylgeranyl diphosphate synthase, 1-deoxyxylulose 5-phosphate synthase, or phosphoenolpyruvate synthase.